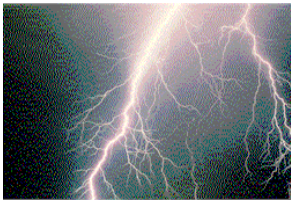


## What Is Electricity?



Electricity is unique among the alternative fuels because mechanical power is derived directly from it, whereas the other alternative fuels release stored chemical energy through combustion to provide mechanical power. Motive power from electricity is produced by an electric motor. Electricity for powering vehicles is commonly provided by batteries, but fuel cells are also being explored. Batteries are energy storage devices; fuel cells unlike batteries, convert chemical energy to electricity.

Electricity can be used as a transportation fuel to power battery electric and fuel cell vehicles. When used to power electric vehicles or EVs, electricity is stored in an energy storage device such as a battery. EV batteries have a limited storage capacity and their electricity must be replenished by plugging the vehicle into an electrical source. The electricity for recharging the batteries can come from the existing power grid or from distributed renewable sources such as solar or wind energy.

## How Is Electricity Produced?

Electricity is produced at power plants located throughout the country, transmitted to substations through high-voltage transmission systems, stepped down to lower voltages, and then is carried to homes and businesses. The Electric Power Research Institute (EPRI) describes the electric vehicle infrastructure as being 98% in place. The remaining 2% involves developing the connection from the grid to the vehicle and determining how recharging vehicles might affect the grid. Some utilities have developed special time-of-use meters and off-peak electric rates to separately monitor EV electricity use from the home and provide incentives to recharge at night when the overall load is down. Electricity to power vehicles can also be made from renewable resources using solar or wind technologies.



## What Vehicles Can Use It?



There are a few manufacturers making specialized electric vehicles, such as buses and neighborhood electric vehicles (NEVs); however, there are no light-duty vehicles being produced by the major auto manufacturers at this time. NEVs are small, low-speed (less than 25 mph) vehicles that are often used in limited on-road fleet applications. NEVs are zero emission vehicles, but do not satisfy EPA's requirements for regulated fleets.



Urban electric vehicles (UEVs) are regular passenger vehicles with top speeds of about 60 miles per hour (mph) and a per-charge driving range of at least 50 miles. They are the same as traditional full-size passenger vehicles but in smaller packages that are ideal for urban applications. Unique benefits of UEVs include easier parking and driving characteristics. The National Highway Traffic Safety Administration has classified UEVs as regular passenger vehicles. Thus, they are subject to the same Federal Motor Vehicle Safety Standards as full-size electric and gasoline-powered passenger vehicles.



The long history and development of EV technology has been key in the development of hybrid electric vehicles and is also playing a major role in fuel cell vehicles. EVs meet all federal motor vehicle safety requirements. The batteries are sealed and all high-voltage circuits are protected from casual contact. High-voltage circuits are also marked, color coded, and posted with warnings to ensure safety.



## Why Should We Use Electric Vehicles?

EVs are zero emission vehicles, meaning they produce no tailpipe or evaporative emissions that contribute to air pollution and global warming. However, electricity production is not pollution-free unless it is produced from renewable sources including hydro, solar and wind power. The cost of electricity per kilowatt-hour usually compares favorably to that of gasoline, but varies depending on location. Check out the latest edition of the U.S. Department of Energy's (DOE) Alternative Fuel Price Report ([http://www.eere.energy.gov/afdc/resources/pricereport/price\\_report.html](http://www.eere.energy.gov/afdc/resources/pricereport/price_report.html)), or contact your local utility for regional electricity prices.

## Where Can I Recharge Electric Vehicles?



In an EV, an energy storage device, typically a battery pack, is used to store the electricity that powers the vehicle's electric motor. EV batteries must be recharged by plugging in the vehicle to an electrical power source. Some EVs have on-board chargers; others plug into a charger located outside the vehicle, but both must use external electricity to recharge the battery.



Most homes, government facilities, fleet garages, and businesses have adequate electrical capacity for charging EVs. Special hookups or upgrades are usually required. Fleets can often take advantage of lower electricity rates if recharging is performed overnight. The DOE maintains a database of regional alternative refueling stations (including electric recharging locations) at <http://www.eere.energy.gov/afdc/infrastructure/locator.html>. California has by far the most electric recharging stations, but several New England States have some as well.



## What is the State Doing for Electric Vehicle Use?

Maryland law allows low-speed vehicles (NEVs) access to roadways. A low-speed vehicle is defined as a four-wheeled electric vehicle that has a maximum speed capability that exceeds 20 miles per hour (mph) but is less than 25 mph. A low-speed vehicle must be registered with the state Motor Vehicle Administration and comply with federal standards. The State Highway Administration or any local authority may prohibit the use of low-speed vehicles on any controlled access road in its jurisdiction. Low-speed vehicles can not be operated on roads in which the maximum speed limit exceeds 30 mph, and except in certain situations, may not cross a highway for which the maximum speed limit exceeds 45 mph.

## What is the Federal Government Doing for EV Use?

A tax credit for the purchase of qualified electric vehicles was originally provided under the Energy Policy Act (EPAct) of 1992. The tax credit was extended through 2007 by the Working Families Tax Relief Act of 2004. IRS Form 8834 can be used to calculate the credit for qualified electric vehicles placed in service. The credit amount equals 10% of the cost of the vehicle up to \$4,000. This credit is scheduled to be reduced to 75% in 2006 and expire in 2007. To qualify for the credit, the vehicle must be powered primarily by an electric motor drawing current from batteries or other portable sources of electricity. All dedicated, plug-in-only electric vehicles qualify for the tax credit, which is available for business or personal vehicles. A tax deduction of up to \$100,000 per location is available for qualified electric vehicle recharging property used in a trade or business.

## Where Can I Find More?

For more general information on electric vehicles, you can visit Electric Drive Transportation Association:

<http://www.electricdrive.org>

Or the U.S. Department of Energy:

[http://www.eere.energy.gov/afdc/afv/elec\\_vehicles.html](http://www.eere.energy.gov/afdc/afv/elec_vehicles.html)

<http://www1.eere.energy.gov/afdc/altfuel/electricity.html>

For more information on the Maryland Clean Cities Program and how you can help:

<http://www.energy.state.md.us/programs/transportation/cleancities/index.html>

